UNIVERSITÄT DUISBURG ESSEN

PHYSIK E=

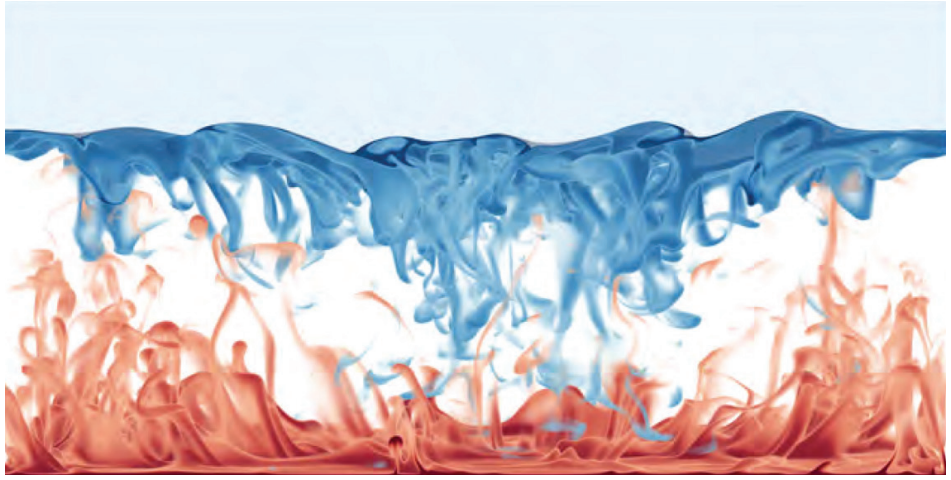
Physikalisches Kolloquium

Mittwoch, 05.11.2025
13:00 Uhr
MC 122 und Zoom

https://uni-due.zoom-x.de/j/64228670246?pwd=RjVQeFNIUkRKRkpiNVpKYXhJaFNLdz09 (gilt für alle Vorträge)

Melting & tipping: From the lab to the ocean

Detlef Lohse, University of Twente



The Atlantic Meridional Overturning Circulation (AMOC) results from the balance between thermal and haline buoyancy in the Atlantic. Presently, water flows from the Gulf of Mexico towards the Northern Atlantic and Europe, but it has been speculated that the massive glacier melting in Greenland could lead to a breakdown or even tipping of AMOC. We numerically study this phenomenon in a very simplified model – AMOC in a box – which consists of double diffusive horizontal convection and, depending on the meltwater input, we reveal four different regimes. Also the ice melting in saline water itself, which is so crucial for the future of AMOC, is studied with the help of very simplified models, which on the one hand reveal the essentials of the process, but on the other hand allow for a one-to-one comparison between experiment and direct numerical simulations. Examples include the melting of ice cylinders in salty water, the melting of ice sheets in Rayleigh-Bénard convection, and the melting by vertical convection in salty water. This work contributes to advancing our understanding of the complex dynamics involved in glacial ice melting within oceanic environments.